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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/401,676	09/22/1999	HENRY ESMOND BUTTERWORTH	UK999-027	4983

7590 09/27/2002

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EXAMINER

LAFORGIA, CHRISTIAN A

ART UNIT PAPER NUMBER

2156

DATE MAILED: 09/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/401,676	BUTTERWORTH ET AL.	
	Examiner	Art Unit	
	Christian La Forgia	2156	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3, 4</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Claims 1 through 11 are presented for examination.

Drawings

2. The drawings filed on 22 September 1999 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1 through 3, 5 through 7, 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent No. 6,081,783 to Divine et al., (hereinafter Divine).
5. As per claim 1, Divine teaches a method for processing work items in a data processing system comprising:
6. generating an interrupt in response to receipt of a work item in the system (Figures 1a, 1b, & 1c; column 9, lines 30-45);
7. servicing the generated interrupt to schedule a task for later processing of the work item, without re-enabling the interrupt (column 16, lines 38-66);
8. subsequently executing the task to process the work item (column 16, lines 38-66); and,

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9. speculatively scheduling a further task for processing of any work items that are subsequently received in the system (column 16, lines 38-66).
10. Regarding claim 2, Divine teaches executing the speculatively scheduled task to process any work items received by the system (column 16, line 38 to column 17, line 20);
11. on a determination that there are no work items to be processed, enabling the interrupt (column 16, line 38 to column 17, line 20); and,
12. on a determination that there are work items to process, speculatively scheduling a further task, without re-enabling this interrupt (column 16, line 38 to column 17, line 20).
13. With regards to claim 3, Divine teaches the work items are managed on a queue (column 99, lines 37-53).
14. As per claim 5, Divine teaches a data processing system comprising:
15. processing means for executing tasks to process work items in the data processing system (Figures 1a, 1b, 1c, & 3; column 9, lines 30-45; column 10, lines 5-21);and,
16. interrupt generating means for generating an interrupt in response to receipt of a work item in the system (Figures 1a, 1b, & 1c; column 9, lines 30-45);
17. wherein the processing means is operable to:
 - service the generated interrupt to schedule a task for later processing of the work item, without re-enabling the interrupt (column 16, lines 38-66);

subsequently execute the task to process the work item (column 16, lines 38-66);
and,
speculatively schedule a further task for processing any work items that are
subsequently received in the system (column 16, lines 38-66).

18. Regarding claim 6, Divine teaches the processing means being operable on a determination that there are work items to be processed to execute the speculatively scheduled task to process the work items and to schedule a further speculative task (column 16, line 38 to column 17, line 20); and,

19. operable on a determination that there are no work items to be processed to enable the interrupt (column 16, line 38 to column 17, line 20).

20. With regards to claim 7, Divine teaches including memory for storing the received work items a queue (Figure 2; column 99, lines 37-53).

21. As per claim 10, Divine teaches a program product comprising a computer usable medium having computer readable program code means embodied in the medium for processing work items in a data processing system, the program code means comprising:

22. code means for causing the data processing system to service a generated work item interrupt to schedule a task for later processing of the work item, without re-enabling the interrupt (Figures 1a, 1b, & 1c; column 9, lines 30-45; column 16, lines 38-66; Appendices);

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23. code means for causing the data processing system to subsequently execute the task to process the work item (column 16, lines 38-66; Appendices); and,

24. code means for causing the data processing system to speculatively schedule a further task for processing of any work items that are subsequently received in the system (column 16, lines 38-66; Appendices).

25. Regarding claim 11, Divine teaches code means for causing the data processing system to execute speculatively scheduled task to process any work items (column 16, line 38 to column 17, line 20; Appendices); and,

26. code means for causing the data processing system to enable the interrupt on a determination that there are no work items for processing (column 16, line 38 to column 17, line 20; Appendices).

Claim Rejections - 35 USC § 103

27. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

28. Claims 4 and 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Divine in view of United States Patent No. 5,555,420 to Sarangdhar et al., (hereinafter Sarangdhar).

29. As per claim 4, Divine does not teach an event that further work items are received after the task is scheduled and prior to execution of the task, the step of executing the task comprises processing all the received work items.

30. Sarangdhar teaches an event that further work items are received after the task is scheduled and prior to execution of the task, the step of executing the task comprises processing all the received work items (column 16, line 9 to column 17, line 21). Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to include the scheduling and execution steps of Sarangdhar with the system of Divine, because it would allow the microprocessors to continue processing the tasks on the queue without being pre-empted.

31. As per claim 8, Divine does not teach an event that further work items are received after the task is scheduled and prior to execution of the task, the processing means is operable to execute to process all the work items.

32. Sarangdhar teaches an event that further work items are received after the task is scheduled and prior to execution of the task, the processing means is operable to execute to process all the work items (column 16, line 9 to column 17, line 21). Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to include the scheduling and execution steps of Sarangdhar with the system of Divine, because it would allow the microprocessors to continue processing the tasks on the queue without being pre-empted.

33. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Divine in view of United States Patent No. 5,682,554 to Harrell.

34. Divine does not teach the interrupt generating means and processing means are embodied in a data storage controller and the work items comprise data transfer requests from an attached host system.

35. Harrell teaches the interrupt generating means and processing means are embodied in a data storage controller and the work items comprise data transfer requests from an attached host system (Figure 2; column 2, lines 46-52). Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to include the data transfer requests of Harrell to the system of Divine, because it would ensure an efficient and fast data transfer between the host computer and subsequent computers.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

37. The following patents are cited to further show the state of the art with respect to job scheduling, such as:

United States Patent No. 6,385,704 to Rao et al., which is cited to show accessing shared memory using a token bit held by default by a single processor.

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian La Forgia whose telephone number is (703) 305-7704. The examiner can normally be reached on Monday thru Thursday 7-5.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alvin Oberley can be reached on (703) 305-9716. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 746-7240 for regular communications and (703) 746-7239 for After Final communications.

40. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Christian La Forgia
Patent Examiner
Art Unit 2156

clf
September 19, 2002

A handwritten signature in black ink, appearing to read 'J. A. Follansbee', written in a cursive style.

JOHN A. FOLLANSBEE
PRIMARY EXAMINER